Bridging Time

understanding date conversions in genealogy

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Abstract

Genealogical research requires careful attention to historical documents, especially when it comes to dates. The transition from the Julian to the Gregorian Calendar, along with the use of specialized date notations, presents significant challenges for genealogists seeking to maintain chronological accuracy. This essay examines the complexities involved in converting dates, with a particular focus on the Julian to Gregorian shift and the intricacies of dual date notation, Old Style-New Style notation, and Quaker date conventions. The Julian Calendar, which was in widespread use prior to the 16th century, was eventually replaced by the Gregorian Calendar, which led to significant discrepancies in how dates were recorded. The essay explores the various methods genealogists use to convert these dates, emphasizing the importance of understanding both the historical context and geographic location of the records in question. Special attention is given to the challenges faced when working with records from countries that adopted the Gregorian Calendar at different times, as well as the implications of Quaker date notation, which uses a numerical system rather than the traditional month names. Through these discussions, the essay underscores the potential for confusion and error when interpreting historical dates and stresses the importance of accuracy in genealogical work. Additionally, the essay highlights how various date notations, including dual dates and Old Style-New Style notation, offer useful tools for genealogists to navigate the complexities of historical timekeeping. Ultimately, the essay serves as a guide to help genealogists navigate these challenges, offering practical advice for ensuring chronological consistency in family histories and preserving the integrity of historical records.

Keywords: genealogy, date conversion, julian calendar, gregorian calendar, dual date notation, old style-new style notation, quaker dates, historical records, calendar systems, genealogical research

Bridging Time

Genealogy, the study of family history and lineage, is an intricate and detailed field that requires precision and careful attention to dates associated with historical records. Among the many challenges genealogists face, understanding and converting historical dates from different calendar systems stands out as a critical task. The transition from the Julian Calendar to the Gregorian Calendar, along with specialized date notations such as Quaker dates, complicates this process. Genealogists must be well-versed in these systems to ensure chronological accuracy in their research. This essay explores the complexities of date conversion, focusing on the Julian to Gregorian Calendar transition, the use of dual date notation, Old Style-New Style notation, and Quaker date conventions. Through these discussions, the essay aims to highlight the importance of accurate date interpretation in genealogical research and provide a framework for navigating these challenges. Ultimately, the purpose of this essay is to guide genealogists in understanding and properly handling historical dates, ensuring the integrity and accuracy of family histories.

The Julian and Gregorian Calendars

By 46 B.C., Rome had become a bustling empire filled with ambition, change, and challenges. At this time, Julius Caesar, ruling as Dictator Perpetuo (“Dictator for Life”), had just returned from a successful military campaign in Gaul. Having risen to immense power after a long and bloody civil war, Caesar was now faced with pressing issues associated with the then-current calendar.

At the time, the calendar in use by the Romans was based on the Moon, rather than the Sun. The calendar did not accurately reflect the year, often falling out of sync with the seasons. This resulted in numerous problems for farmers, officials, and priests who relied on the calendar for the scheduling of their work.

Determined to resolve the problems associated with the faulty calendar, Caesar called upon the assistance of an astronomer named Sosigenes. The astronomer explained that the current system needed to be reformed through the adoption of a new calendar.

After considering the advice of Sosigenes, Caesar made a bold decision. He introduced a new calendar based on the solar year rather than the lunar year. The introduction of this calendar was quite significant because it meant that the new calendar would better align with the Earth's orbit around the Sun.

Named after Caesar himself, the new calendar came to be called the Julian Calendar. It established the 25th of March, which was then the day of the vernal equinox, as the first day of the year. The calendar then assumed that the tropical year - the measure of time for the Earth to orbit the Sun - was 365.25 days in length. Based on this assumption, a standard year consisted of 365 days allocated across 12 months which, in turn, were allocated as 3 months to each season. To accommodate the fractional portion of the measurement and keep the calendar in line with the seasons, the Julian Calendar introduced a leap year every four years by adding an extra day to the month of February during those leap years.

The introduction of the Julian Calendar was a revolutionary step forward for the Roman world. In short time, it became the standard calendar in use across the Roman Empire and remained in use for centuries. However, a single event of the 4th century would, by the latter part of the 16th century, reveal that the Julian Calendar was inherently flawed.

In the year 325 A.D., the First Council of Nicaea established that Pascha (the Easter holiday) would be observed by all Christians on the first Sunday following the first full moon on or after the vernal equinox. The calendar date of the vernal equinox was, at the time, about the 21st of March. However, by the year 1582, the vernal equinox was occurring approximately 10 days earlier than it did in 325 A.D., according to the Julian Calendar.

The flaw in the Julian Calendar was that the tropical year was assumed to be 365.25 days in length when, in actuality, the tropical year is 365.2422 days in length. This discrepancy, which will be hereafter referred to as the "Julian flaw," resulted in an accumulation of 11 additional minutes per year on the calendar, or an accumulation of slightly more than 3 additional days every 400 years.

The Roman Catholic Church was deeply concerned that the Julian flaw was causing the vernal equinox to slowly drift towards earlier dates on the calendar. Left unchecked, the vernal equinox would have eventually drifted from the months attributed to spring into those months attributed to winter.

On 24 February 1582, in response to this concern, Pope Gregory XIII issued a papal bull called *Inter gravissimas* to institute a new calendar, later to be known as the Gregorian Calendar, which would return the vernal equinox closer to the 21st of March. To accomplish this objective, 10 days were chopped from the Julian Calendar of 1582 thereby eliminating from the new calendar the Julian flaw which had accumulated since 273 A.D. Also, in order to prevent such a noticeable drift in the future, as seen due to the Julian flaw, the rule regarding the determination of leap years was revised. This revision established that every year that is exactly divisible by 4 is a leap year, except for centurial years that are not also exactly divisible by 400.

Another change made under the new calendar was that the start of the year was moved from the 25th of March to the 1st of January. This particular change, however, had already been instituted in several places throughout Europe long before the issuance of the papal bull, though those places still observed the Julian Calendar after they instituted the early change to the start of the year.[1]

The Pope, however, was unable to mandate that the Gregorian Calendar be used in place of the Julian Calendar. Observation of the Julian Calendar was a civil matter, and the most that he could do was recommend the changes and hope that the nations of the world would adopt the new system.

Shortly after the issuance of the papal bull, Catholic states and countries adopted the Gregorian Calendar. Other countries, mostly Protestant, continued to adhere to the Julian Calendar for considerable spans of time before realizing the advantages offered by the Gregorian Calendar. In many cases, some parts of countries made the conversion early while other parts of the same countries converted on later dates. There are also countries which converted to the Gregorian Calendar, then back to the Julian Calendar, then back to the Gregorian Calendar.

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[1] Countries that started the year on January 1st prior to the papal bull of 1582, along with the years that they made their changes, were: Lorraine, 1579; France, 1564; Holy Roman Empire, 1544; Portugal, 1556; Prussia, 1559; Southern Netherlands, 1576; Spain, 1556; Sweden, 1559; Venice, 1522; and parts of Denmark and Norway, since the 13th century.

Although the Gregorian Calendar adjusted Julian Calendar dates by 10 days, this adjustment applied only to countries that adopted the Gregorian Calendar in its early years. Due to the continued drift of the Julian Calendar (about 11 minutes per year), countries that adopted the Gregorian Calendar later had to make further adjustments. Over time, this drift accumulated, and these countries had to make an additional adjustment of one or more days when they switched to the Gregorian system, depending on how much time had passed since the original reform.

Within what is now the United States of America, those territories once occupied by the French Colonial Empire and Spanish Empire made the conversion on 9/20 December 1582, only to return to the Julian Calendar once those territories had changed out of their possession. Territories under the rule of the British Empire made the conversion on 2/13 September 1752. Alaska, which was formerly a territory of the Russian Empire, did not make the conversion to the Gregorian Calendar until 6/18 October 1867, when it was incorporated into the United States.

Date conversion considerations

Genealogists must carefully consider whether to convert dates from Julian to Gregorian calendars when working with historical sources. This process isn’t as simple as just appending a slash and the last two digits of the following year to dates from the first three months of years before 1753.

When a date is sourced from a published work, such as a family history book or historical records from a state or nation, the first thing to check is whether the author of the publication has already made any attempts at converting dates. If the author has done so, regardless of whether the conversion is accurate or not, any further attempts at converting those dates will result in inaccuracies. On the other hand, if the author did not convert the dates but you, the genealogist, decide to adopt the practice of conversion, failing to convert those dates will lead to inconsistencies in your research chronology.

Regardless of whether the dates used in your research come from published secondary sources or from primary sources, it is important to consider the locations where those sources were created, along with their dates of creation, when deciding whether the date needs to be converted. For example, a birth record dated 1 December 1800 in Virginia would not require conversion, as Virginia had already adopted the Gregorian Calendar by that time. However, if that same birth record were created in Alaska, the date would need to be converted from the Julian Calendar to the Gregorian Calendar, since Alaska did not adopt the Gregorian Calendar until 1867.

Not only do the date and location of a record's creation help determine whether the record's date should be converted, but they are also crucial for understanding the proper adjustments to be applied during conversion. For example, if a record was created in February of 1723 in Virginia, the date would align with the Julian calendar, where the year was not considered to have shifted to 1724 until after March 25. Therefore, when converting the date to the Gregorian calendar, the year would be advanced to 1724, reflecting the shift in the start of the year. However, if the same record were created in Scotland, the year would remain 1723, as Scotland adopted January 1 as the start of the year in 1600 but continued using the Julian calendar until 1752, when the transition to the Gregorian calendar occurred.

In addition to the foregoing, genealogists performing date conversions must observe the fact that some countries adopted January 1 as the start of the year prior to the creation of the Gregorian Calendar. When converting dates from records originating in these countries, regardless of the dates on which those countries adopted the Gregorian Calendar, the year of the records' dates will never be advanced to the next year.

Understanding the complexities of calendar systems is essential for genealogists to maintain accuracy in their research. The decision to convert dates from the Julian to the Gregorian calendar is not always straightforward and requires careful consideration of both the historical context and the geographical location of the records. By verifying whether the source has already undergone conversion and paying attention to the local calendar practices of the time, genealogists can ensure their chronology remains consistent. This attention to detail not only helps preserve the integrity of family histories but also allows for a more accurate understanding of historical events and timelines.

Dual date notation

When it comes to dates of historic events, the use of dual date notation is immediately recognizable by the inclusion of one or two slashes or vincula, accompanied by additional numeric digits. The following are examples of five valid dates using forward slashes: 1 Jan 1600/01; 1/11 Jan 1600/01; 1/11 Jan 1600; 31/10 Feb 1600/01; and 31/10 Jan 1601. Those same examples follow, this time using vincula: 1 Jan 16$\frac{00}{01}$; $\frac{1}{11}$ Jan 16$\frac{00}{01}$; $\frac{1}{11}$ Jan 1600; $\frac{31}{10}$ Feb $\frac{00}{01}$; and $\frac{31}{10}$ Jan 1601. For the remainder of this chapter, dual dates will be expressed using slashes.

Of the five dual date examples given in the previous paragraph, each one means something entirely different from the other, viz.

- 1 Jan 1600/01 – In this example, only the year of the date is made dual. Dual dates written in this format indicate that the date has not been converted from the Julian Calendar to the Gregorian Calendar. The additional digits appended to the year indicate only that the event occurred during the first three months prior to 25 March of the Julian Calendar, and in the Gregorian year following the Julian year in which the event was originally dated.
- 1/11 Jan 1600/01 – In this example, both the day of the month and the year have been made dual. Dual dates written in this format indicate that the date has been converted from the Julian Calendar to the Gregorian Calendar. The digits in the numerator positions of the dual day and dual year indicate the day and year as they appear on the Julian Calendar. The digits in the denominator positions indicate the day and year, after conversion, as they appear on the Gregorian Calendar.
- 1/11 Jan 1600 – In this example, only the day of the month has been made dual. Dual dates written in this format, as with the previously explained example, have been converted from the Julian Calendar to the Gregorian Calendar. The digits in the numerator position of the dual day indicate the day as it appears on the Julian Calendar. The digits in the denominator position indicate the day as it appears on

the Gregorian Calendar. Because the date in this particular example fell within the first three months of the year prior to 25 March, the absence of dual dating of the year indicates that the date was associated with a record created in a country, such as Scotland, which adopted 1 January as the first day of the year prior to its adoption of the Gregorian Calendar, and that the date of the record falls between those two adoption dates.

- 31/10 Feb 1600/01 – In this example, both the day of the month and the year have been made dual, but with a twist - the value in the numerator position of the day is greater than the value in the denominator position. Dual dates written in this format indicate the same as indicated in the example for 1/11 Jan 1600/01, except that the value of the day's numerator being greater than its denominator means that the event occurred on the Julian Calendar in the month previous to the one shown in the conversion.
- 31/10 Jan 1601 – In this example, only the day of the month has been made dual, but with a twist - the value in the numerator position is greater than the value in the denominator position. Dual dates written in this format indicate that the event occurred on the day shown in the numerator position, on the month and year of the Julian Calendar prior to the ones shown in the converted date. The remainder of the dual date (i.e., 10 Jan 1601) is the representation of the converted date as it appears on the Gregorian Calendar. Because the value in the numerator position of the day is greater than the value in the denominator position, for this particular example, the absence of dual dating on the year does not necessarily indicate that the date was associated with a record created in a country, such as Scotland, which adopted 1 January as the first day of the year prior to its adoption of the Gregorian Calendar. This is because the value in the numerator position represents the Julian Calendar date, and its higher value indicates that the Julian Calendar date was in the previous month of December.

Understanding and interpreting dual date notation is essential for genealogists and historians working with historical records, especially those created during the transitional period between the Julian and Gregorian calendars. The five examples explored in this chapter illustrate the various ways in which dates can be represented, from simple dual year notations to more complex dual day and year formats. Whether the dual dates indicate a period before the Julian calendar's new year shift, represent a full conversion between the two calendar systems, or show events that span the months between the two calendars, recognizing these patterns ensures accurate interpretation of historical documents. As calendar systems evolved and different regions adopted the Gregorian calendar at different times, dual date notation serves as a valuable tool in bridging these temporal gaps. By properly understanding the structure and context of dual dates, genealogists can avoid confusion and enhance the reliability of their research timelines, ensuring a more precise reconstruction of past events.

Old Style-New Style notation

When conveying historical dates, Old Style-New Style notation offers itself as a valuable alternative to dual dates. In this system, "Old Style" (O.S.) refers to dates on the Julian Calendar, and "New Style" (N.S.) refers to dates on the Gregorian Calendar. The abbreviation used to indicate the style of the date is typically placed before the date, such as O.S. 31 February 1600 and N.S. 1 January 1601.

With Old Style-New Style notation, different constructs may be used to convey dates that have been converted from the Julian Calendar to the Gregorian Calendar. One common construct involves wrapping the Old Style date within the New Style date, such as 1 January [O.S. 31 February 1600] 1601. When the year remains the same for both the Old Style and New Style dates, the year is omitted from the Old Style part of the construct, as in 31 [O.S. 20 August] 1753. In both of these examples, the New Style abbreviation is omitted since it is implied by the construct.

The use of constructs to convey Old Style-New Style notation is flexible, adapting to the needs and writing styles of genealogists. The example dates from the previous paragraph could also be expressed as N.S. 1 January 1601, O.S. 31 February 1600, or O.S. 20 August 1753, N.S. 31 August 1753, depending on the genealogist's preference.

Other than the fact that it offers more readability to dates, use of the Old Style-New-Style notation has another significant advantage over use of dual date notation. While dual date notation provides a short, precise, and effective means by which to convey a date associated with the Julian Calendar, or converted from the Julian Calendar to the Gregorian Calendar, modern genealogy software does not yet enable genealogists to make full use of that notation system. At most, some of the more advanced commercial genealogy software available allows the use of dual dates where only the year is allowed to be made dual.

Through the strategic use of the description field associated with dated events input into genealogy software, event dates can be appended with their O.S. or N.S. equivalents, depending on the style of the dates entered into the date fields for the events. For example, “William Pope, Jr., was born on 15 Oct 1662 (N.S. 25 Oct 1662) in Nansemond, Virginia.”

The data for the example given in the preceding paragraph could just as easily been entered into the genealogy software so that it reported “William Pope, Jr., was born on 25 Oct 1662 (O.S. 15 Oct 1662) in Nansemond, Virginia.” This approach to recording dates, however, carries a significant duty for the genealogist to record all dates in the genealogy using New Style dates. Such a duty would require the genealogist to convert all Julian dates to the Gregorian Calendar, and that duty would require further researching each date to determine whether or not it had already been converted prior to its publication in the source material.

While both Old Style-New Style notation and dual date notation serve as useful tools for genealogists when conveying historical dates, the former offers certain advantages in terms of clarity and flexibility. Old Style-New Style notation allows for the straightforward presentation of Julian and Gregorian dates, accommodating various constructs to suit the preferences of the genealogist. Although genealogy software currently limits the use of dual date notation, with many platforms allowing only the dual year format, genealogists can still effectively manage historical dates by utilizing description fields for additional context. However, this approach requires careful attention to ensure accuracy in date conversion, especially when dealing with records where the Julian calendar was still in use. Ultimately, both notations have their place in genealogical research, and understanding when and how to apply each system is essential for maintaining chronological consistency and accuracy in family history research.

Quaker dates

The Quakers, known more formally as the “Society of Friends,” developed their own distinctive approach to dating documents. Unlike many other groups that use the traditional names of months in their dates, Quakers have eschewed this practice due to the pagan origins of the month names. Instead, they use a numerical index system to denote the months within a given calendar year.

When looking at a Quaker date such as “2d. 3m. 1995,” one might initially be puzzled by the absence of a familiar month name. However, upon closer examination, it becomes clear that this date translates to March 2, 1995, with “3m.” representing the third month in the calendar.

For novice genealogists, the most important detail when dealing with Quaker dates is the single detail most often overlooked: the numeric representation of the month refers to the position of the month in the calendar in use when the record was created. While “2d. 3m. 1995” refers to 2 March 1995 according to the Gregorian Calendar in use at the time, “2d. 3m. 1660” would refer to 2 May 1660 according to the Julian Calendar in use at that time.

Many Quaker records also use words to spell out the numeric representation of months, such as “the first month” or “the last month.” When this occurs in a Quaker date under the Julian Calendar, it is important to remember that the start of the Julian year was on March 25. As such, under the Julian Calendar, the month of March would be both the first and the last month of the year. This means that it would be entirely possible to encounter a date written as “the first of the last month, 1660,” but never “the first of the first month, 1660.” Additionally, “the last of the first month, 1660” would refer to the 31st of March, and “the last of the last month, 1660” would refer to the 24th of March.

When converting a Quaker date to a date on either the Julian Calendar or the Gregorian Calendar, a similar approach as described earlier for Old Style-New Style notation can be used by genealogists in order to preserve the original Quaker date with the research. By entering the unconverted Quaker date, preceded by the abbreviation “Q.D.” (Quaker Date), into the description field for the dated event, the event date can be appended with its Q.D. equivalent. This approach can also be used in combination with O.S. and N.S. dates by the use of a semicolon. For example, "William Pope, Jr., was born on 15 Oct 1662 (N.S. 25 Oct 1662; Q.D. 15d. 8m. 1662) in Nansemond, Virginia."

Published genealogies show that, as late as the 20th century, many genealogists were unaware of the subtle intricacies of the Quaker system of dating records. Others were either uncertain or unwilling to convert Quaker dates to Julian or Gregorian calendar dates.

Guy Scobi Rix appears to have been one such genealogist who was unaware of the intricacies of the Quaker date system. In his *History and Genealogy of The Ricks Family of America* (1908, pp. 10-11), he quoted Quaker birth records previously published by the Southern Historical Society. Rix also provided a transcription of records from an old Bible (pp. 13-14), noting that "The record does not agree with the original records as recorded in the old church books, recorded by Isaac, sen., and very likely were recorded from memory." However, when the dates Rix provided from the old Bible are converted from Julian calendar dates to Quaker notation, many of those records do, in fact, match up with the Quaker birth records Rix had quoted from the Southern Historical Society publication.

Rix's unfamiliarity with Quaker dates led him to perform numerous incorrect date conversions throughout his book. For example, he converted "Isaac Rickesis, son of afore Is and Kathren was born the seventeenth day of the sixth month in the year 1669" (p. 10) to "Isaac, b. June 17, 1669" (p. 14). Had Rix understood Quaker dates, he would have realized that Isaac was born on 27 [O.S. 17 August] 1669.

In a similar misstep, William Rivers Pope, throughout his *Histories of the Pope, Carter, and McFerrin Families of Middle Tennessee* (1950), presented Quaker dates that he incorrectly interpreted as Julian date notation. For example, W.R. Pope wrote, "William [Pope], born August 16, 1662; died May 28, 1728. Married Mary Haile, at Chuckatuck, Nansemond County, Virginia, on February 11, 1708" (p. 11). Shortly thereafter, on the same page, W.R. Pope quoted a record of the Quaker marriage, which stated that the couple had been married "upon the 8 day of the 2 mo 1708." In the first quote from W.R. Pope, every date presented is an incorrect conversion from a Quaker record. As for the date of marriage, had W.R. Pope been familiar with Quaker dates, he would have known that the couple was married on 19 [O.S. 8 April] 1708.

When relying upon previously published genealogies as research source material, genealogists must bear in mind that the authors of those genealogies may not have understood the implications of a date being sourced from a Quaker record. Those authors may very well have published incorrectly converted dates from Quaker notation without specifying that they were sourced from Quaker records. As such, genealogists must remain on alert for clues which might suggest that a date was obtained from a Quaker source and, if so, verify that the date was correctly converted. Furthermore, genealogists must bear in mind that if they discover that a published date was sourced from a Quaker record, it is very well possible that other dates associated with the individual may also have been sourced from Quaker records.

Conclusion

Throughout this essay, we have explored the complex and nuanced nature of historical date conversion, with particular attention to the challenges posed by Quaker date notation and the shift from the Julian to the Gregorian Calendar. In the first chapters, we laid a foundation by explaining the historical context and significance of these calendars. We delved into the origins of Quaker date conventions, noting how the Quakers' distinctive approach to timekeeping was designed to be practical yet often confusing for modern researchers. We also examined the difference between the Julian and Gregorian calendars, focusing on the transition that took place in various regions, including how dates before and after the shift are often misinterpreted in genealogical research.

Subsequent chapters explored the intricacies involved in translating and understanding historical dates in genealogical contexts. We looked at the importance of precision and consistency in recording dates and how seemingly minor mistakes can lead to significant errors in family history. The essay emphasized the need for careful attention when interpreting Quaker records or any document that may contain dates affected by the Julian Calendar. Moreover, we offered insights into the various methods and tools that genealogists can use to handle date conversions, while also stressing the limits of what can be expected from those without a deep understanding of these systems.

The message from all these discussions is clear: date conversion is not a task to be taken lightly. Mistakes in converting dates can ripple through family trees, leading to incorrect assumptions, erroneous connections, and ultimately hindering the efforts of future genealogists. Therefore, it is essential for genealogists, particularly those unfamiliar with the intricacies of historical calendars, to exercise caution.

As a genealogist, if you are not absolutely certain as to how to convert dates from Quaker notation or from the Julian Calendar to the Gregorian Calendar, the wisest decision you can make is to present the date exactly as you find it and leave the task of date conversions to those who know what they are doing. Fail in this, and the fruits of your efforts may make themselves into obstacles, stumbling blocks, and unnecessary detours for genealogists who follow in your research. By leaving accurate but unconverted dates intact, you protect the integrity of your work and provide a crucial reference point for those who will seek to decode these records in the future. Genealogy is a pursuit of accuracy, and safeguarding the clarity of each document ensures that the path forward remains open for those who come after us.

Resources

Bond, John J. *Handy-Book of Rules and Tables for Verifying Dates with the Christian Era.* London: George Bell & Sons, 1875.

"Handbook of Dates for Students of British History." In *Royal Historical Society Guides and Handbooks, Vol. IV*, edited by Christopher Robert Cheney and Michael Jones, 17-20. Cambridge: Cambridge University Press, 2000.

Parise, Frank. *Book of Calendars.* New York: Facts on File, 1982.

Poole, Robert. "Give Us Our Eleven Days!: Calendar Reform in Eighteenth-Century England." *Past & Present* 149, no. 1 (November 1995): 95-139.

Steele, Duncan. *Marking Time: the epic quest to invent the perfect calendar.* New York: John Wiley & Sons, 2000.